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Start Scouting for Stalk Borer

By Erin Hodgson, Department of Entomology, and Adam Sisson, Integrated Pest Management

Iowa has been steadily accumulating degree days ahead of schedule in 2012. Over the weekend, some parts of southern Iowa hit an important degree day benchmark for common stalk borer. About 10 percent of stalk borer larvae can begin moving to corn after accumulating 1,300 to 1,400 degree days. Part of southwestern and southeastern Iowa have reached that threshold and we recommend starting to scout this week in corn (Fig. 1). Central and northern Iowa should start scouting May 12 to May 18, if warm temperatures continue. This is about three weeks earlier than last year.

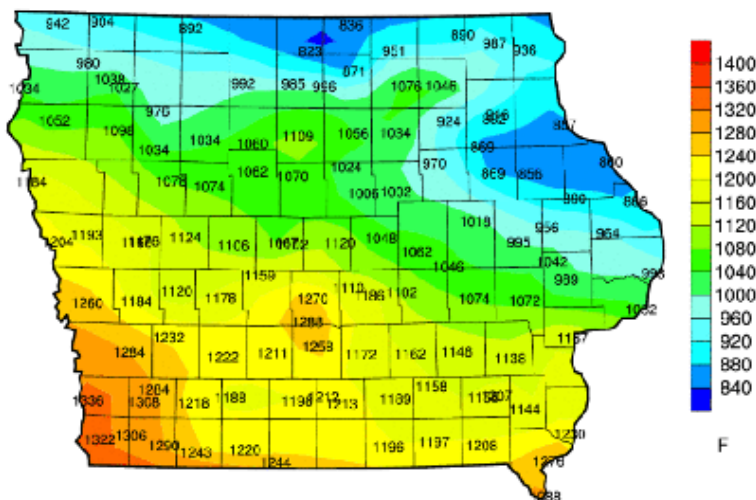


Figure 1. Growing degree days accumulated (base 41°F) for stalk borer larval movement in Iowa for 2012. Begin scouting around 1,300 to 1,400 degree days. Map courtesy of [Iowa Environmental Mesonet](#), ISU Department of Agronomy.

Stalk borer eggs are laid on grasses and weeds in the fall, and young larvae will feed in the spring until they outgrow the plant. Corn can become infested when stalk borer larvae move to find bigger host plants, typically adjacent to grassy edges of emerging corn. The most susceptible stages of infestation are at V1-V5, or about 2 to 24 inches in plant height. Larvae can damage corn by defoliating leaves and burrowing into stalks. Stalk borers do not typically cause economic damage when feeding on the leaves, but can clip newly emerging plants and cause death (Fig. 2). More often, larvae kill corn plants by entering the stalk and destroying the growing point (i.e., flagging or dead heart). A dead heart plant will have outer leaves that appear healthy, but the newest whorl leaves die and can cause barren plants.



Figure 2. Stalk borer can shred corn leaves and destroy the growing point.

Stalk borer infestations are more likely in corn surrounded by giant ragweed. Female moths prefer to lay eggs in weedy areas in August and September, so minimizing weeds in and around corn during that time will discourage egg-laying. Using herbicides to kill spring weeds can force stalk borer larvae to infest young corn plants. Long term management requires controlling grassy edges around corn so that mated females will not lay eggs in that area during the fall.

Fields with persistent stalk borer infestations should be monitored every year. Applying insecticides to infested corn is not effective because the larvae are protected once tunneled into the stalk. Instead, target foliar applications to larvae as they migrate from grasses to corn. Look for larvae inside the whorls to determine the number of plants infested. The larvae are not highly mobile and typically only move into the first four to six rows of corn. Look for new leaves with irregular feeding holes or for small larvae resting inside the corn whorls. Larvae will excrete a considerable amount of frass pellets in the whorl or at the entry hole in the stalk. Young corn is particularly vulnerable to severe damage, but plants are unlikely to be killed once reaching V7 (seven true leaves).

Control. To prevent stand loss, scout and determine the percent of infested plants. The use of an economic threshold (Table 1), first developed by ISU entomologist Larry Pedigo, will help determine justifiable insecticide treatments based on market value and plant stage. Young plants have a lower threshold because they are more easily killed by stalk borer larvae.

Table 1. Economic thresholds for stalk borer in corn, based on plant stage, expected yield and market value.

leaf stage	\$5/bu			
	150	175	200	225
1	3.46	2.97	2.60	2.31
2	4.23	3.63	3.17	2.82
3	5.60	4.80	4.20	3.73
4	5.95	5.10	4.46	3.97
5	6.80	5.83	5.10	4.54
6	11.90	10.20	8.93	7.94
7	32.84	28.15	24.63	21.89

leaf stage	\$6/bu			
	150	175	200	225
1	2.89	2.47	2.16	1.92
2	3.53	3.02	2.65	2.35
3	4.67	4.00	3.50	3.11
4	4.96	4.25	3.72	3.31
5	5.67	4.86	4.25	3.78
6	9.92	8.50	7.44	6.61
7	27.37	23.46	20.53	18.24

leaf stage	\$7/bu			
	150	175	200	225
1	2.47	2.12	1.86	1.65
2	3.02	2.59	2.27	2.02
3	4.00	3.43	3.00	2.67
4	4.25	3.64	3.19	2.83
5	4.86	4.16	3.64	3.24
6	8.50	7.29	6.38	5.67
7	23.46	20.11	17.59	15.64

If an insecticide is warranted, some products can be tank-mixed with a fast burndown herbicide, or applied seven days after a slow burndown herbicide. Border treatments should be considered if infestations are localized. Insecticides must be well-timed so that products are reaching exposed larvae before they burrow into the stalk. Make sure to read the label and follow directions, especially if tank-mixing with a herbicide, for optimal stalk borer control.

Life cycle. There is just one generation per year in Iowa, and the egg is the overwintering stage. Like all insects, stalk borers develop based on temperature. Egg hatch typically occurs around April 19 to June 5, or 50 percent egg hatch happens at 494 growing degree days. The number of larval molts is variable depending on food quality, and ranges from seven to nine instars. Fully developed larvae drop to the soil to pupate. Approximately 50 percent of pupation happens at 2,746 growing degree days, with 50 percent adult emergence at 3,537 growing degree days. Peak adult flight occurs during the first two weeks of September.

Description. Stalk borer larvae have three pairs of true legs and four pairs of fleshy prolegs. The body is creamy white and dark purple with brown stripes. Often there is a creamy white stripe running down the back. A distinctive feature is an orange head with two dark lateral stripes (Fig. 3). The adults are dark gray and brown colored moths, with jagged white lines and two to three clusters of white spots.



Figure 3. Stalk borer larva. Photo credit Marlin E. Rice.

For more information on stalk borer biology and management, read a recent Journal of Integrated Pest Management article by Rice and Davis (2010), called "[Stalk borer ecology and IPM in corn.](#)"

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